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ARTÍCULOS DE INVESTIGACIÓN

The relation between the epistemological beliefs of teachers and students and their behavior in educational practice

La relación de las creencias epistemológicas de profesores y alumnos con la conducta que manifiestan en la práctica educativa

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Summary

This article analyzes the relation of the epistemological beliefs of students and teachers and the actions deployed in the classroom. The framework is the study of personal epistemology, which was developed, among other researchers, by Hofer, Pintrich and Schommer. The research method was, within the qualitative paradigm, through case studies, given the interest in describing the phenomenon in a specific scenario. The results show the epistemological beliefs of teachers and students, the events that make them evident and its relationship with the behaviors shown in the classroom. The role of pedagogical beliefs as mediation between personal epistemology of educational actors and their practice are described and, finally, the relation between beliefs and educational practice is illustrated by analyzing specific class events and the justification expressed by teachers and students about their actions in the classroom.

Keywords: Epistemological beliefs, pedagogical beliefs, personal epistemology and educational practice.

Resumen

Este artículo analiza la relación de las creencias epistemológicas de alumnos y profesores con las acciones que despliegan dentro de aula. El marco del trabajo es el estudio de la epistemología personal desarrollado, entre otros investigadores, por Hofer, Pintrich y Schommer. El método de investigación fue, dentro del paradigma cualitativo, el estudio de casos, dado el interés de dar cuenta del fenómeno en un escenario concreto. En el análisis se utilizaron categorías teóricas y analíticas que permitieron dar cuenta de la relación entre creencias y acciones de los actores educativos. Como resultado del análisis se describen las creencias de docentes y estudiantes, los eventos que las detonan y la relación de estas con las actividades y acciones que ocurren en el aula. Posteriormente, se analiza el papel de las creencias pedagógicas como mediación entre la epistemología personal de los actores educativos y su práctica y, finalmente, se ilustra la relación entre creencias y práctica educativa mediante el análisis de eventos de clase concretos y la justificación que hacen los actores educativos acerca de sus acciones en el aula.

Palabras clave: Creencias epistemológicas, creencias pedagógicas, epistemología personal, práctica educativa, métodos pedagógicos.

Introduction

For centuries, many thinkers have expressed the idea of a relation between a person's beliefs and their conduct. In the year 1651, English thinker Thomas Hobbes claimed that the actions of men came from their opinions (Hobbes, 1980). This idea has been studied by social sciences and has become the epistemological beliefs field of research which has generated knowledge on the subject, especially on their role in learning.

Several researches have studied teachers and student's epistemological beliefs through questionnaires and not through their practice inside the classroom. This has created a void that needs to be filled by analyzing their actions during class and by asking them why they do what they do in the classroom, that is to say, unveiling the epistemological beliefs related to the specific behaviors they display.

Another reason that originated this study is that previous researches have analyzed separately the epistemological beliefs of teachers and students. The current research studies this phenomenon conjunctly, analyzing it from the point of view of the actions, interactions and dialogues weaved in their educational tasks and observing, in the practice, how they make their personal epistemology operative in the activities they carry out in the classroom.

The guiding question posed for this research was: How are the epistemological beliefs of teachers and students related to the actions they display in the educational practice? As subsidiaries, there were other questions about each participant's beliefs and the behaviors related to them.

This work is in the area that studies the relation between epistemological beliefs and learning. By studying this relation, we are investigation individual conceptions about what knowledge is and the way it is obtained, which is called personal epistemology (Hofer & Pintrich, 2002), since these individual conceptions can lead the person to show different reactions, behaviors and opinions before the same educational event.

Epistemological beliefs and educational practice.

Personal epistemology is a set of individual beliefs about the nature and acquisition of knowledge (Schraw, 2013). Schommer (1994) presented four categories which render account of the beliefs of such epistemology: the ability to learn, the structure of knowledge, the learning speed and the certainty of knowledge. Each individual beliefs oscillates between a simple, naïf posture, on one extreme, and a very sophisticated, on the other extreme.

The ability to learn oscillates between two extremes. One is considered to be fixed since birth (simple) and, the other can change throughout life (sophisticated). The belief about the structure of knowledge can be, in the simple extreme, that knowledge is isolated and produced with no ambiguity, and in the sophisticated extreme, that it appears from a high concepts interrelation. About the learning speed, the belief can consider that it happens quickly, in only one step (simple) and, in the other extreme, that it happens gradually (sophisticated). Finally, the belief about the certainty if knowledge, the simple vision considers that knowledge is absolute, with no changes or evolution, and the sophisticated one considers knowledge as relative, something which changes and evolves.

Personal epistemology proposed by Hofer and Pintrich (1997) is composed by two dimensions which refer to the nature of knowledge (what knowledge is) and two dimensions which refer to the process of knowledge (how knowledge is acquired). The latter contribute to Schommer's categories, which is why they were also included in the analysis.

The belief about the source of knowledge can be, on the simple extreme, that its origin is always external, whereas, on the sophisticated one, knowledge can come from any source, even from the student's own reflections. The belief in knowledge's justification refers to the ideas people have on the use of its evidence and argumentation. Knowledge is on two poles: on the naïf pole there is its uncritical acceptation and, on the sophisticated one, the idea that all knowledge must be justified with arguments and evidences.

Epistemological beliefs form a set of personal premises and presuppositions about knowledge and the way it is acquired (learning), they include the notion of knowledge, the way it is built, evaluated and produced, where it resides (Hofer & Pintrich, 2002), what its nature is and how its

construction is justified. As subjective theories about knowledge and the way it is obtained, they have direction and action control functions and are the base for the actions displayed by teachers and students in the practices carried out inside the classroom.

Hofer and Pintrich (1997) and Hofer (2001) claim that the beliefs about the nature of knowledge and its acquisition must be considered as the core of individual theories that give rise other, more specific beliefs, such as those they have on teaching and learning. Accordingly, these authors claim that pedagogical beliefs are derived from the teachers' epistemological beliefs. Studies on epistemological beliefs have mostly been quantitative ad have focused on their relation with several variables. Schommer-Aikins and Duell, (2013) claim that the researchers' hypothesis is that the effects of epistemological beliefs are subtle and that their influence on learning is measured by other aspects of cognition and affection (p. 320). A brief summary of these reaserches' findings is presented below.

Otting et al. (2010) found that there is a structural relation between the student's epistemological beliefs and their conceptions on teaching and learning; Fullmer (2014) discovered that the students who believe that knowledge is uncertain have more positive attitudes towards science; Al-Alwan (2013) found that sophisticated beliefs about learning ability, learning speed and knowledge simplicity contributed significantly to self-efficacy, deep learning and academic achievements of Jordanian university students; Ismail et al., (2013) found direct and indirect effects of epistemological beliefs on academic performance in mathematics: the more inclined the students are towards adopting a deep approach to learning, the higher their grades are.

Other studies have focused more on the measurement of epistemological beliefs. Aypay (2011) found out that Turkish teachers in training distinctly preferred constructivist conceptions over traditionalist conceptions in teaching; on the other hand, Ching (2012) informed that high school teachers in Singapore tended to have rather undeveloped epistemological beliefs; a study by Yılmaz-Tüzün and Topçu (2013) suggests that teachers in training's epistemological ideas change over time; García and Sebastian (2011) found that " the students in high school pedagogy present significantly more

sophisticated epistemological beliefs than those who studied pedagogy for pre-school and elementary school".

Regarding the relation between epistemological beliefs and practice, Therriault and Harvey (2013) found that high school teachers changed the sophistication of their epistemological beliefs as they taught, whereas they continued to be sophisticated compared to the disciplinary knowledge taught in the university. On the other hand, Minsu (2014) found consistent epistemological beliefs and pedagogic practices, unlike other studies he revised.

Regarding the disciplines (Ismail et al., 2013), they found that social science students were more likely to use a deep learning approach than physics students. They suppose this is due to social sciences having a reflective nature which requires reflection and interpretation.

In general, studies about epistemological beliefs show correlations with different variables, which do not always go in the same direction, possibly due the effects of the context, and such as Schommer-Aikins and Duell (2013) stated, due to other cognitive, affective variables.

Method

Given the objective of this research: to analyze the relation between teachers and students' beliefs with the actions they carry out in the classroom, it was necessary to describe educational practices with all of their variations and to understand the meaning given to them by the participants, which is why the study is placed in the qualitative paradigm. The case study method was used because the interest is in the singularity and not in the generality (Flick, 2004).

Non participant observation was used (Spradley, 1980) to describe the participants' actions in the classroom and deep interviews were used to know the explanations of the participants about their behavior (Merriam, 2002), and here their epistemological and pedagogical beliefs manifested.

The research scenario was a private university in the city of Torreon, in the Mexican State of Coahuila, specifically three groups of graduate classes in educational processes with the teachers and students normally participating in them.

In order to choose the groups, the criterion was that the teachers had different ways of behaving in the classroom, according to the students' opinion. Three teacher were chosen and, according to the students, the first one was methodical, the second one, directive and, the third one, open minded and flexible. The reason behind the difference in the teachers' attitude was the interest in knowing the reaction of the students, based on their epistemological beliefs, to the teacher's different behavior.

For the analysis of epistemological belief the three teachers giving the lectures were interviewed, as well as the twelve students who participated in their classes. To choose the students that would be interviewed in order to find out about their beliefs, the following criteria were used: (1) that they actively participated in the class by expressing their point of view; (2) that they asked questions frequently or had doubts about how to do their job; (3) that they expressed points of view that were different to those of their classmates; (4) that they participated and augmented their points of view and (5) that they posed explanations during class. The students who had these characteristics were ideal, for during the interview they would be asked about their actions and opinions in order to know their epistemological and pedagogical beliefs.

During the access to the campus the objectives of the research were told to the participants. They were also told that the information obtained during research would only be used for the research and that their names would be erased or changed to keep anonymity and maintain their privacy and confidentiality (Goetz & Lecompte, 1996).

The collecting of observational data took place during two terms. By the end of the second term, the twelve selected students were interviewed, as well as the three teachers, which is why the data for the analysis are shown in Table 1.

Table 1.
Data corpus.

Data collecting	Registration	Documents	Total
Observations	Video	Description and transcription	29
Interviews	Audio	Transcription	15

Most of the analysis was made in an inductive way starting from epistemological pedagogical or other kind of beliefs manifested by the students and teachers during the interviews then they were asked why they did what they did or gave their opinion and evaluated the way it had been registered during observation. Interviewees justified their actions and interactions basing on their beliefs.

The analytical and theoretical categories that were used are shown in the following Table 2, together with subcategories or elements.

Table 2.
Analysis categories, subcategories and elements.

Categories	Subcategory/element
Epistemological beliefs	• Learning speed • Ability to learn • Structure of knowledge • Justification of knowledge • Source of knowledge
Pedagogical beliefd	• Importance of the teaching and learning context • Order and sistematicity • Learning situations' architecture • Teacher's authority • Feedback • Applicability of knowledge
Actions	• Actions made • Information exposition • Explanations • Indications • Discussion topics • Thematic emphasis • Learning situations • Dialogues • Group work • Tasks

Triggers of the belief's explanations	• The argument is beyond the subject being analyzed • Affirmations with no back up are made • Insufficient information is presented • Information with no link to practice is presented • There is a restricted view on a certain subject • Lack of precision in instructions • Lack of clarity in presentation
Products of the beliefs	• Positive evaluations • Criticism • Consensus • Dissents • Solicituds

After the analysis, the way the epistemological beliefs are related to the actions of teachers and students in the classroom was shown.

Results

The motivation of this research were epistemological beliefs, but not per se, but because they are related to the behavior that takes place during educational practices in the classrooms through more concrete beliefs: pedagogical beliefs, which become the operative link of epistemological belies, interceding in the actions of the subjects.

In order to answer the question "how are epistemological beliefs related to the actions displayed by teachers and students for teaching and learning?" the information obtained from the observation and interviews was analyzed and classified into three categories: (1) what the belief produce in the practice; (2) the trigger from which the beliefs are explained, and (3) the pedagogical beliefs as mediators between epistemological beliefs and actions. Then, six specific practice relations were identified, and they demonstrate how they are influence by the beliefs of the actors intervening in it.

The students beliefs.

The 335 epistemological belief expressed by the students when asked for an explanation about what they did in the classroom were classified into seven categories comprising: learning speed, learning ability, knowledge structure,

knowledge certainty, knowledge source and knowledge social construction. The number of expressions about epistemological belief manifested by the students on each of the categories is shown in Figure 1.

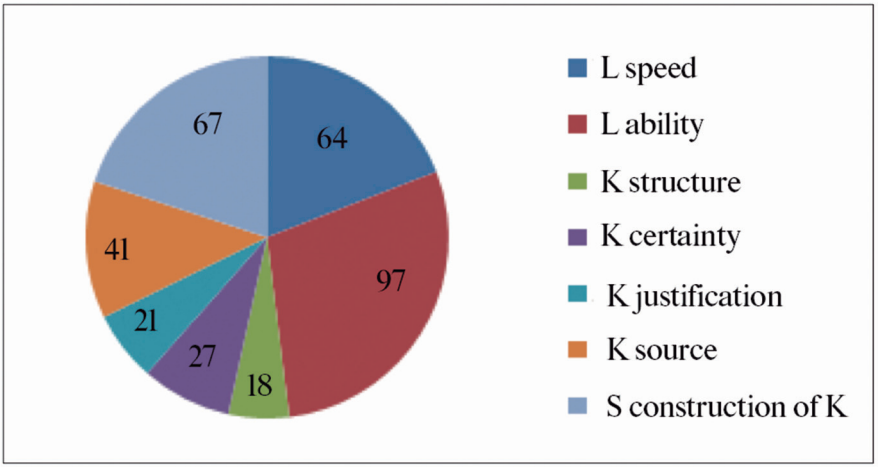

Figure 1. Distribution of the student's epistemological beliefs.

One of the main findings was that, in spite of most of the student's epistemological beliefs are sophisticated, they coexist with simple beliefs, especially in the categories regarding learning speed, learning ability and knowledge source, as we can see in Table 3.

Table 3.
Coexistence of simple and sophisticated beliefs.

Learning speed		Learning ability		Knowledge structure		Knowledge certainty		Knowledge justification		Knowledge source	
Sophisticated	Simple	Sophisticated	Simple	Sophisticated	Simple	Sophisticated	Simple	Sophisticated	Simple	Sophisticated	Simple
70%	30%	75%	25%	58%	42%	90%	10%	75%	25%	72%	28%

Simple beliefs coexist with sophisticated beliefs in two different ways: changing over time or simultaneously. An example of the first happened like

this, at the beginning of the term: "*I expected the teacher to give me more quickly the format to follow in order to solve problems*" (E, AaL2), but later they claim "*learning requires a full process, even if it is simple*" (E, AaL2). It can be observer that, for this student, learning is quick in a given time of the course and, later, her opinion is more sophisticated.

An example of simultaneity of simple and sophisticated beliefs was observed during an interview in which a student thinks that "*it is easier to learn when you get the idea on the first try than if you need to try several times; if the latter is the case, you can get lost*" (E, AoH1). But, later, the same person says, during the same interview, that "*learning is a process which requires several steps*". In this second case, sophisticated and simple beliefs coexist.

Epistemological beliefs are general, but more specific beliefs, also called pedagogical beliefs, come from them. The teachers base on the latter to design learning activities and to evaluate the students' actions and interactions, whereas the students, starting from their own pedagogical beliefs, evaluate and criticize the teacher's actions and the activities they propose and, at the same time, they suggest ways they think their own learning could be encouraged.

Students presented pedagogical beliefs regarding the importance of the teaching and learning context, the order and sistematicity, the architecture of learning, the teacher's authority and the feedback and applicability of knowledge. The amount of expressions rendering account of these beliefs is 136, distributed in Figure 2, as shown below.

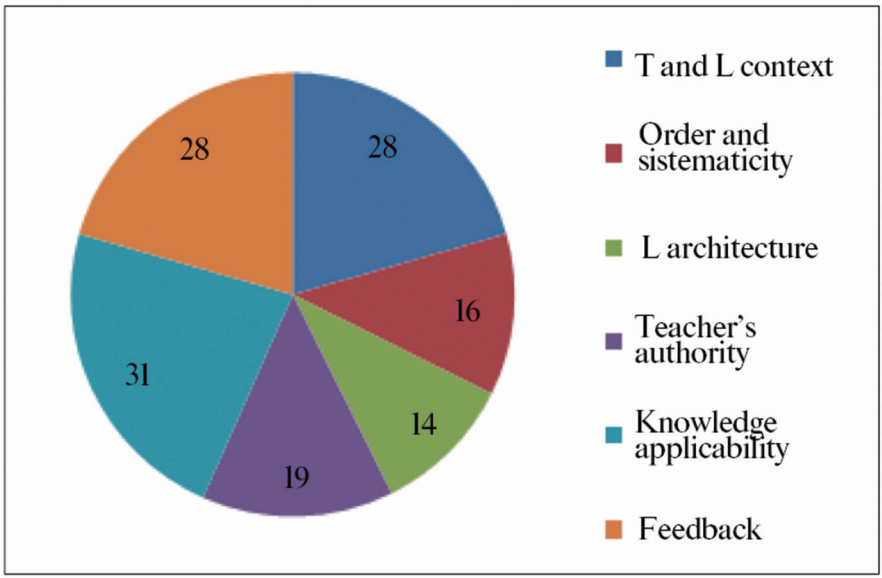

Figure 2. Distribution of the students' pedagogical beliefs.

As it is show, pedagogical beliefs on knowledge applicability, feedback and the learning and teaching context were the most abundant ones, which could mean that they are the most relevant for the students. As it will be explained later, both epistemological and pedagogical beliefs are strongly related to the actions teachers and students show in the classroom.

The teachers' beliefs.

The three teachers, for their part, expressed 35 epistemological beliefs during the interviews. The beliefs they express refer to: learning speed (10), knowledge justification (8), knowledge certainty (5), learning ability (5), knowledge structure (4) and knowledge source (3).

The epistemological beliefs the teachers manifested the most were learning speed and knowledge justification, which makes us guess that those were the most relevant to them. One of the most recurrent ideas was that learning is a process that requires time in order to take place. Two teacher claim that "*the student needs time to process the information*" (T1). "… *nothing can be understood hastily*" (T3).

Regarding the belief in knowledge justification, the teachers emphasize on the idea that knowledge must be sustained by evidence by pointing out that "*the evaluation of knowledge must be based on objective elements*" (T2). They also point out the need to verify the learning when they say that "*the students' learning must be verified through the tasks they perform*" (T1), especially through its "*practical application*" (T1).

The teachers' and students' beliefs cause different behaviors and interactions in the classroom, which are explained in details below.

What the beliefs cause.

In the analysis of the observational data and the justifications the participants gave to their actions in educational practice interrelation, it was found that the actions in which the beliefs manifest are placed in the following categories:

- Positive evaluations.
- Criticism.
- Consensus.
- Dissents.
- Requests.

Positive evaluations came out of the comparisons the students made between the teachers' actions and their epistemological beliefs or their pedagogical derivations, as in the following example, in which a student positively values one of the teacher's activities (OM2) basing on the pedagogical belief that making diagrams facilitates learning. "*I feel identified because I also make diagrams, and when the teacher makes one…I relate the ideas along with the teacher*" (Aa3).

Criticism comprises the manifestations about negative valuations to activities in the classroom or to the teacher's action that the students don't think will lead to learning or, at least, don't seem to be the best options. For example, in one of the classes, a student, starting from an epistemological belief about learning speed, complained when one of the teachers (OM1) asks the students to perform a task, but doesn't give them time to do it. A student says about this: "*I would have liked to have more time. I correct, and*

then I do a well developed work in real life, but it just stayed there, in the air…" (AaL2).

Consensuses appear when the actions or activities in the classroom are evaluated basing on a shared belief. An example of this happens in the class (OM1) in which the teacher emphasizes on the importance of collecting evidence in order to justify the posing of a problem, the students agree and one of the students claims: "*yes, teacher…it seems obvious that if we have a diagnosis we know if we are starting on the right path*" (Aal1).

A dissent case originates from the pedagogical belief the students have about the usefulness of knowledge (OM2) when a student thinks the final work she presented was incomplete and says: "*now that we have the results, what are we going to do with this?*" and then "*where are we going to put this*?..." (aaJ4).

Another student has a differs from her teacher regarding the idea that the construction of knowledge is a process that takes time, whereas, apparently, the teacher thought that declarative knowledge was enough. The students claims the following: "*What we have is the idea of how to do a project…how to do a sketch, which is different than having a finished project…I have an idea of how projects are designed and I can develop one, but it will take me longer because I still don't have the competence*" (AaL2).

In class (OM2) the teacher requires the students to sustain everything they claim. About this, the teacher says: "i*n order to present ideas you need to have evidence*". Later, they claim: "*the interesting thing in research is not to adjudicate my thoughts, but to show evidences and to build arguments that can back my hypothesis up*".

As it has been shown, the teachers' and students' epistemological and pedagogical beliefs produce positive evaluations, criticism, consensuses, dissents and requests. These actions are caused because there is a judgment of the educational actors regarding what is happening. The actors judge taking they beliefs as a parameter.

Triggers of the explanations of the beliefs.

There are certain events which trigger the explanations of the students' and teachers' beliefs, such as:

- The argument is not related to the subject being discussed.
- Statement with no back up are being made.
- Insufficient information is being presented.
- Information with no link to practice is being presented.
- There is a restricted vision of a subject or phenomenon.
- There is not enough precision in the instructions.
- There is not enough clarity in the presentation.

Some examples of these situations are presented below. One of them is when the argument is out of the subject being analyzed. A student complains about the teacher saying "*the absolute can be found only in divinity*" (AaC7), because in her opinion it is not valid to justify and empiric, philosophical issue through theology; when the teacher has a restricted view: "*I think we should have studied more authors, seen different options, a variety of concepts, I think it was not enough, we needed more options to see more points of view*" (AaH1); when there is confusion regarding the instructions: "*if there are no precise instructions you will totally get lost…what are the needs, what is going on…what for, where is it going to take you…"* (AaJ4), or when things are not clear enough, like in the following case, where a student says: "*I've been listening to your different opinions, and I think it's not clear…we are focusing on people, but here, looking at the document… they are talking about things…we are talking about objects*" (AaL2)".

Before this type of situations, the students express their pedagogical or epistemological beliefs, because what happens contradicts the way they think knowledge is built, acquired or justified or the way they think someone should learn or teach.

Pedagogical beliefs as mediation between epistemological beliefs and actions.

Usually, epistemological beliefs do not manifest directly, but, in the case of educational practices, they need to be inferred based on the pedagogical

beliefs expressed in the teachers' judgments about how they must teach and the students' judgments about how they learn better and, therefore, about how teaching should be organized. Pedagogical beliefs are the hinge between the abstract of epistemological beliefs and the actions that take place during class. This is why the detection of the latter has to take place basing on the firsts.

Specific situations showing the relation of epistemological beliefs in practices.

In order to show how the epistemological and pedagogical beliefs which take place in the practice relate to what the teachers and students do in the classroom, two situations in which, due to the beliefs of teachers and students, different class dinamics are generated, are presented.

Concordance of epistemological beliefs.

In this dialogue stands out the relation of the epistemological beliefs of teachers and students on the structure of knowledge and the pedagogical beliefs on the order and justification. Since the beliefs of all the participants matched, the class took place with no setbacks and with everybody's consent.

In class (OM1), the teacher proposes to talk about what makes a project and he starts by asking what is an educational project, to which a student answers: Aa3- *In my opinion, it is the design, the development of the guideline of an idea which will allow us to take care of a need that has been detected in an educational institution*...The teacher writes this down on the board…then he points out: *there are no right or wrong answers, this is the idea about a problem that will be developed*. The teacher's sophisticated epistemological belief on knowledge certainty becomes evident, as by considering there are no right or wrong answers he emphasizes on the relativity of knowledge.

Aa5 – *I see it as a work plan in order to develop certain goals, and it includes strategies, times, work proposals; it implies that the student organizes their ideas basing on the needs they observe and their knowledge in order to shape the project.* In this sentences, the student's sophisticated epistemological belief about knowledge structure is inferred, because their

conception about a work plan comprises a series of elements that the student needs to organize and shape, interrelating their ideas, their needs and their knowledge.

T- *The teacher writes the elements of the definition on the board (making a concept map) and makes a contrast between it and what has been said earlier…if I'm not right, say `I didn't mean to say this`.* In the activity, the teacher shows consistency with his belief about the structure of knowledge, from which the pedagogical activity of making a concept mal that presents the relation between the different elements contributed by students is derived.

AaD6- *A work proposal built by objectives and goals we have to reach by specifying the activities we need to carry out in order to do it, and it needs to be upgraded constantly in order to respond to any change there could be*. For the student, the plan is not a fixed thing, but it needs readjustment in order for it to respond to the needs it was proposed to help solve; that is to say, there is a sophisticated epistemological belief about the certainty of knowledge, since it is impossible to create an absolute, fixed project, but a project is relative to the changing circumstances of the environment.

Aal2- *According to the subject we're studying, a process to plan and to come up with and to attain an educational goal…in order to achieve a pedagogical goal. We need to start from different points, do detect different problems…the formulation of actions which take place in order to solve said phenomenon…then we have to implement actions to solve the problem, to finally evaluate and report the advancements…* This ideas indirectly show the sophisticated epistemological belief in the structure of knowledge through the expression of the idea that a project must be built starting from different points and from the detection of different problems, which requires to have several interacting ideas, to organize them and shape them, and this way the actions to take and the evaluation as an important factor if the design would be contemplated.

T- *Add the element of evaluation, which is important to every project… to obtain information for feedback…as we can see, we have an idea of what it is…what it could possibly be…this is what you have in this diagnostic evaluation, we need to contrast it with other perspectives…and, this way, we'll have support…* The teacher sketches the sophisticated belief about the

structure of knowledge by proposing that, in order to sustain a project it is necessary to contrast other perspectives; that is to say, there are more visions that could be applied in order to give strength to the project, there are several points of view to consider in order to develop it.

The teacher's epistemological belief on the certainty of knowledge encouraged a reflective, unrestricted group dialogue, in which the class subject was freely discussed with the student's contributions. This also facilitated the organization of the information in the shape of a concept map by the teacher and the students through the contrast of the ideas that came up, which shoed empathy between the teacher's and the students' epistemological beliefs on knowledge structure, which caused the exercise to flow constructively.

Disagreement between teacher and students due to a difference in their pedagogical beliefs.

Opposite to the previous situation in which the convergence of ideas led to agreements and to a harmonic work, another dialog that show the divergences between the teacher's and the students beliefs on class activities is presented. This dialog took place by the end of the term.

During the last session of the subject (OM1), the teacher proposed a group evaluation of the class. The students proposed the evaluation of the use of readings in class. The teacher agreed and asked the students to express themselves without interruptions and, after that, he would express his opinions.

To begin, the teacher addressed the group by pointing out that they would do it on the board by writing their ideas and verbally commenting them. Then he sums up what he wrote and comments on every participating student.

AL2- *I think we should have time outside the classroom to do the readings, which would allow to have a previous analysis, the student would arrive to class already having thoughts on the readings and would then present them, opening a discussion to enrich what was read*. The student shows a sophisticated belief on the learning speed by considering they need

time to perform a reflective analysis. There is also the belief on the social construction of knowledge in the idea that, by presenting and discussing ideas in class, this would allow them to enrich their reading.

AaD6 – *I think the readings are too dense and technical to do them in the classroom, we need time to do them outside the class, because it is hard to get their meaning in the classroom*. This expression shows a sophisticated epistemological belief on the learning speed by considering that reading requires enough time to be revised and for the student to deepen in its content.

AaM3- *I expected to have more discussions inside the classroom, to open a discussion about the program's subjects to widen our vision of them, I like discussing, it is how I learn, but by having so much to read, I think we spend too much time doing that inside the classroom, which doesn't give us enough time to share ideas with other classmates*. What AaM3 stated shows an epistemological belief on the social construction of knowledge, since, for her, group discussion is how she widens her visions on different subjects. Related to this, there is also a pedagogical belief in a learning architecture focusing on group discussion of ideas, which was not done because they did too many readings in the classroom.

T- *The readings are a necessary element to the analysis of the subjects, we can't discuss if we have not read, the dialogue would lack the back up given to it in the classroom and it is not much what you read outside of the classroom, I checked how many times you accessed the platform and how long you spent on it, and they were few and short.* The teacher shows a sophisticated epistemological belief about learning speed, since discussing a subject in the classroom requires previous reading. In addition, it shows an epistemological belief on the justification of knowledge by pointing out as evidences that he checked the platform and the students' accesses were few and short.

In this evaluation we can see that both the students and the teacher share the epistemological belief that knowledge is not quickly acquired, but its construction needs time and dialog. However, they strongly disagree in the pedagogical issues. Whereas the teacher asks them to read in class, the students consider that this does not contribute to learning, because they need

time to deeply read the material and they want to have time in the classroom to analyze what was read. In this case, the class activity caused discomfort because teacher and students didn't agree in their pedagogical beliefs.

In these two situations we can see that epistemological and pedagogical beliefs of students and teachers have a great influence on the classroom dynamics. This gives the educational practice great complexity, because every group is different and its members have different beliefs on knowledge and learning which could be in agreement or disagreement with the teacher's and their classmates' beliefs.

Discussion

Most of the participating students' beliefs were inclined towards sophistication: they though learning was a gradual process (70%), that the ability to learn is not innate but developed (70%), that knowledge is built through the interrelation of ideas (58%), that knowledge is relative to the context and the subjects perspectives (90%), that knowledge must be backed up by evidence and rationally argued, that there are multiple sources of knowledge (72%). This tendency towards sophistication can be due to the fact that, as stated by Ismail et al., 2013, social sciences have a reflexive nature and, therefore, they require reflection and interpretation. Besides, Perry (1968), Kitchener and King (1981) and Schommer (1994) had found that, the more advanced is the study level of the students, the simple beliefs become more and more sophisticated.

Several studies have found that subjects from different contexts have more or less sophisticated beliefs (Ching, 2010; Aypay, 2011; García & Sebastian, 2011), but in the context presented in this paper simple and sophisticated versions of the same belief coexisted when they interpreted the educational events that took place in the classroom. This is also different to what Schommer-Aikins (2004) poses, in the way that the beliefs are presented in a more or less independent way, for in this case it was the same belief presented as sophisticated or simple en different occasions.

The students and teachers' diversity of beliefs presented in educational practices makes them complex and difficult to handle for the teacher, which

makess the implementation of teaching strategies difficult. This fact is manifested in two ways: (1) if there is a concordance between the teacher's and the students' beliefs, the class flow without obstacles, there are consensuses and acknowledgments between them, and it is developed in a participative way by those who participate in it, and (2) if there are differences in their beliefs, there are criticisms, dissents and disagreements, both in the contents of the class and the way they are approached, This information about the results of the epistemological beliefs in the classroom is a contribution that does not appear in previous studies.

The study also contributed new information about the situations that show the explanation of epistemological or pedagogical beliefs, which contributes to this field of knowledge.

Conclusions

This work has widened the study focus of epistemological beliefs by approaching them from the activities that take place inside the classroom. The study shows how epistemological and pedagogical beliefs can be identified by asking the educational actors the reasons why they do what they do in the practice. The justification of their actions is based on a belief on the nature of knowledge or learning, and from there they judge pedagogical activities.

The study of epistemological beliefs at this level has allowed to detect valuable information in an Education Master's program which could be useful for the teachers to pay attention to what the students lack and to agree more in the development of teaching and learning processes, to explain their beliefs by aiming to reveal the intentions of the actions and to try new forms of proceeding in the classroom.

Epistemological beliefs can't always be directly studied, but they frequently need to be questioned through activities and pedagogical beliefs the teachers have, since they are like a bridge between epistemological beliefs and practice.

A main implication of the results of this study is the need for a deeper study of the beliefs based on everyday classroom practices, ant not only in

an abstract way through questionnaires. By asking the educational actors the reasons of specific classroom actions, they express their beliefs without them being influenced by and instrument or by the direct questions of a researcher.

An implication for the educational practice is that the teachers do not assume that they act in the classroom only from a technical-pedagogical reality, but that they also do it from a set of beliefs on the nature of knowledge and the way it's acquired. It can't also be assumed that the students are willing to learn what the teacher decides and the way the teacher decides, because they also have a set of beliefs on which their willingness to learn and the evaluation they make of the learning process depend.

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